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CHAPTER 13.0 TIME-MOTION APPROACH TO SETTING NURSE STAFFING STANDARDS¹

13.1 Introduction

As described in Chapter 1, we have identified three general approaches for establishing appropriate nursing home staffing standards. One approach, soliciting the consensus opinion of experts, is examined in Chapter 6, and has been found to have some serious limitations. The second approach is empirical: Measures of nurse staffing and resident outcomes measures are obtained for a large number of nursing homes and the relationship between the two are examined. This empirical approach constitutes the primary strategy of this project, yielding the results presented in the previous four chapters (Chapters 9 through 12).

The third approach, what we broadly characterize as a “time-motion” method, attempts to identify the time it takes to complete nursing tasks for nursing home residents. These times, aggregated to the facility level, determine the nurse staffing required to provide this level of care. The staffing algorithms derived from this method are adjusted for differences in the kind and intensity of care needed by residents with differing levels of acuity and functional limitations.

This time-motion approach is the subject of this chapter. As a method of deriving appropriate nursing staffing standards, it is intuitively understandable, particularly to those who find the statistical modeling of the empirical approach to be too complex, or suspect. If there is an impact on some important resident outcomes by what nursing staff actually do, an assumption that would be hard to reject, then it would seem reasonable to determine how much time it takes to perform these necessary nursing tasks and the consequent staffing implied by this allocation of time.

Determining the time required performing nursing tasks is more difficult than it might seem at first glance. Residents with different medical conditions and functional limitations have different nursing needs. These needs can also change over time, as a resident enters the nursing home, very often from the hospital, and their stay can continue for several years. There is also the problem of measuring the time for direct patient care from indirect care. Direct care can include such hands-on activities as bathing, incontinence care, shaving, feeding, and assistance with ambulating. Others might include charting a resident’s conditions or meeting with other staff or family about the resident as direct care non-hands-on tasks. There are also indirect care activities such as ordering supplies and general training of staff that are not linked to any specific resident. To add to the difficulty of measuring staff time, there are the

¹ This chapter was written by Marvin Feuerberg and Susan Joslin (HCFA). We wish to acknowledge our appreciation for the printed information and clarifying discussions from Lt. Col. Harper (U.S. Army), William Thoms, and Abt’s Karen Reilly. Editorial assistance was provided by Jeane Nitsch, HCFA.

inevitable un-scheduled activities such as answering requests for assistance, cleaning up spills, or transporting residents to doctors' visits. Finally, the relative proportion of each kind of activity- e.g., direct vs. indirect - varies by whether we are referring to nurse aides, LPNs, or RNs.

Although this time-motion approach is intuitively appealing, it has some severe limitations for setting appropriate nursing standards, particularly as currently developed. This chapter will first examine three time-motion methods for setting nurse staffing levels: the U.S. Army Workload Management System for Nursing (WMSN); William Thoms' "Management Minutes" system; and HCFA's Staff Time Measurement studies on nursing care in nursing homes in 1995-1997. As will be shown below, we find all three of these particular efforts of little value for setting staffing standards.

Nevertheless, we think the time-motion approach has merit as will be demonstrated in the next chapter. The remaining and bulk of this chapter presents an extensive analysis by Jack Schnelle, UCLA, utilizing this time motion approach with respect to appropriate staffing of nurse aides. Schnelle synthesizes the results of various published and unpublished studies together with some very limited primary data collection in order to estimate the labor resource requirements for achieving good ("best practice") and/or optimal resident outcomes. This emphasis upon staffing necessary for achieving good or optimal outcomes focuses on the high end of the staffing distribution in contrast to the outcomes analysis presented in the preceding four chapters, Chapters 9 through 12, which focused on thresholds at the low end of staffing distributions that are linked to bad outcomes.

13.2 U.S. Army Workload Management System for Nursing (WMSN)

13.2.1 Introduction

Initially, the WMSN was totally unknown to us or in the case of the Thoms' Management Minute system, only vaguely known. Both these systems were recommended to us.² With respect to the

² Both Martha Mohler, RN, MSN, of the National Committee to Preserve Social Security and Medicare, and Mary Ann Wilner, Ph.D., Representative of the Direct Care Alliance (formerly Paraprofessional Healthcare Coalition) recommend these two systems as useful for our study. In a June 9, 1999 letter to Nancy Ann Min de Parle, Administrator, Health Care Financing Administration, Dr. Wilner voiced several concerns and recommendations. HCFA was urged to "Utilize Expertise and Established and Validated Nursing Services Staffing Methodology from Other Venues . . . we recommend that Abt and HCFA draw upon the extensive documented and validated experience of the nursing experts of the U.S. Uniformed Services health system and their Workload Management System for Nursing. They should also refer to the Management Minutes System developed by William Thoms. In a August 11, 1999 follow up letter to Mr. Michael Hash, Acting Administrator, HCFA, Dr. Wilner again urged the "use of other validated staffing studies . . . Regarding earlier validated staffing studies undertaken by the Army and William Thoms, we encourage Dr. Feuerberg [HCFA project office for this staffing study] to speak directly to both William Thoms and Major Harper, the chief staffing expert for the U.S. Army. Their experience is invaluable to this study." We followed this recommendation and contacted both Thoms and Harper.

WMSN we originally contacted Dr. James Vail, Associate Dean for Graduate studies at the College of Nursing and Health Sciences at George Mason University, who was instrumental in the development of the WMSN. Dr. Vail referred us to others, including Major Ralph Grinnell, who was identified as the subject matter expert. Major Grinnell referred us to a web site where we could secure more background documents. According to Major Grinnell this system was developed in acute care facilities and would not apply to nursing homes - it assumed “. . . young healthy bodies” and some retirees. Hence, from this initial inquiry it did not appear that the WMSN would be applicable to nursing homes.

One of the problems in evaluating the WMSN and Thoms’ Management Minutes System is that these systems were developed some 20-25 years ago to assist the Army and in the case of Thoms, a single nursing home in New Hampshire, in assessing their nurse staffing needs; as such, these developmental efforts were not primarily focused on research, although some research was conducted. It is not clear whether any published studies resulted, and in any event, the evidence in support of these two systems may not be retrievable over two decades later, whatever their merits.

Although the WMSN (and the Management Minutes System) did not appear promising from our initial inquiry, we decided upon a two phased approach to obtaining more information about the utility of the WMSN for our study. First, it became clear that if the utility of these two systems was to be evaluated, we needed to have more than oral histories and testimonials. Accordingly, we sent on December 6, 1999, formal letters to all the individuals who had been recommended as knowledgeable. The letters requested a written response to three questions:

1. “What is your position, role, or function with respect to the WMSN? How familiar are you with this system?”
2. “What is the evidence supporting this system? Most important, can you send or refer us to a key article, report, or document that provides the supporting evidence?”
3. “Do you think the WMSN is applicable to the impaired population typically found in U.S. nursing homes?”

Nearly identical questions were asked in a December 7, 1999, letter to William Thoms.³ The letters also indicated that after their response was received, we would call them to ask a few follow-up questions. Written responses were received from both Lt. Col. Richard Harper and William Thoms, the two key informants according to Mohler and Wilner, and one or more follow-up telephone conference calls were conducted. The assessment below is based on their written replies, other printed materials we obtained, and information obtained from the two separate conference calls on February 17, 2000 with Lt.Col. Richard Harper and Williams Thoms.

³ The letters can be found in Appendix G.

13.2.2 U.S. Army WMSN for Setting Staffing Standards

It is probably understandable that after some 20 years, we were not able to find any printed evidence about the development of this system. According to Lt. Harper, time-motion studies were conducted in well over eight facilities, mostly larger community hospitals and acute care facilities, including some overseas. Estimates of both direct and indirect patient care times were obtained. He also indicated that the training of army RNs and Aides are comparable to their civilian counterparts. Although this system is a Department of Defense tri-service model, it was originally developed and primarily used/accepted by the army.

Some indication of how this system would staff nursing homes can be discerned from a 1990 training manual that we obtained.⁴ The WMSN is an automated nursing management information system used to determine the manpower requirements, both professional and paraprofessional nursing personnel, for inpatient units. More specifically, this system can be used to determine the staffing needs for medical/surgical, newborn nursery, neonatal intensive care and psychiatric inpatient nursing units. It cannot be used to determine the manpower requirements for outpatient psychiatric treatment centers, recovery room, labor and delivery and outpatient same day surgery units.

The nursing manpower requirements are based upon patient acuity levels which are determined daily by the nurse responsible for the patient. Nurses use a patient acuity worksheet (general or psychiatric) to select the appropriate critical indicators to calculate each patient's acuity. Critical indicators are the nursing care activities that have the greatest impact on time spent in direct patient care. Each critical indicator has a point value. There is a total of ninety-nine critical indicators and they are grouped in one of the following categories: Vital signs monitoring, activities of daily living, feeding, IV therapy, treatments/procedures/medications, respiratory therapy, teaching, emotional support and continuous observation.

The WMSN process is done daily and begins with the nurse calculating an individual patient point value based upon the sum of their critical indicators. Next, patients are placed in the appropriate acuity category according to their total value. There are seven patient categories with category one having the lowest value, zero for patients on leave from the facility, and category seven having the highest sum of critical indicator values between 146 and 256 points. The hours of nursing care and recommended number and mix of personnel are then calculated based upon the total number of patients in each category. This recommended number and mix of personnel are compared to the actual number of available staff to determine if staffing levels are within the required number. Staffing levels or workload are adjusted accordingly to balance any deficiencies or staff excess.

13.2.3 U.S. Army WMSN: Critique

⁴ The Workload Management System for Nursing, Headquarters Department of the Army, November 1990.

There does not appear to be a more authoritative source on the U.S. Army WMSN system than Lt. Col. Harper. He is a consultant to the Army Surgeon General for nursing methods, in a sense “owns” this system through consulting to others, and rewriting manuals and policies on this system. Yet, Harper himself does not think this system, as currently developed, is appropriate for the population found in nursing homes today. He writes in an informal 1/6/00 e-mail response to our letter:

“I will begin by telling you that I am very familiar with the WMSN and have written numerous manuals pertaining to it over the years. And while it has served its purpose well there are concerns that cannot be overlooked when addressing the WMSN and its intended use and in the possibility of adapting it to another setting. Some of my concerns follow:

The research on the WMSN is over 20 years old at this time. Medicine has changed significantly during that period and the WMSN is in severe need of revision.

The WMSN was standardized in a variety of acute care military hospitals along a broad range of acuity's and ages of patients. From a pure research standpoint, the validity of the WMSN for a narrow acuity and age range of patients in a chronic care setting would be difficult to support.

The WMSN is somewhat complex and time intensive to implement and maintain. There is a high learning curve associated with the WMSN and is resource intensive to teach. There are easier and quicker acuity based staffing systems that may be able to provide better answers for this population.

I wish I could support the notion that the WMSN, in its current form, could serve to identify the proper staffing requirements for nursing home patients. But, I believe the limitations of the WMSN and the corresponding scientific and political arguments against using it, might overshadow the efforts to delineate a staffing system for the nursing home population.

While I am sure that you have explored hundreds of possibilities, I can only recommend that some objective form of measurement, like the WMSN, be adopted. There are many acuity based systems that are quite easy to use and available to all.

Having said that, I can also recommend the following. If a satisfactory system is not identified, the WMSN does have a broad foundation of research behind it coupled with many years of data and could be used as a basis to develop an original staffing requirements system specific to the nursing home environment. I would suspect that such a system could be researched and developed within an 18-month time frame.

Regardless of what you choose to pursue, I hope your efforts succeed. There clearly is a need for regulatory guidance in some form for the industry.”⁵

Richard W. Harper LTC, AN

Lt. Col. Harper does not think the resource intensive, 20 year old WMSN developed for an acute population can be applied to the population typically found in nursing homes today. Even if the time-motion estimates and required staffing of this system could be applied to the current nursing home population, there is another very severe limitation to this system. There is no evidence or claim that these staffing standards result in good outcomes. According to Harper, it was assumed that the facilities that were used to develop the time estimates were indeed good facilities, and their staff times were necessary to produce good care. No evidence on outcomes was generated. Indeed, the emphasis upon outcomes, while important to health researchers today, was not a concern at the time this system was developed. As will be shown in the following sections, this is a severe limitation of Thoms’ Management Minutes system, and to a lesser extent, HCFA’s Staff Time Measurement studies.

13.3 William Thoms’ Management Minutes System

13.3.1 Introduction

The time-motion/staffing estimates of Thoms’ system were obtained from a nursing home with apparently a similar chronic-care needs population as found in nursing homes today, in contrast to the acute population of the WMSN described above. However, the nursing times were developed over a 3-yr period, 1972-1975, from 700 records within a single nursing home, the Greenbriar Terrace Healthcare nursing home in Nashua, New Hampshire. It would be hard to argue that nursing time estimates generated from a single facility over 25 years ago could provide sufficient basis for establishing current staffing standards. Further, William Thoms’ reported to us that the nursing times were not derived from direct observation but were estimated by senior nurses. However, Thoms also noted that on the occasions when he checked the nurses estimates, he found them to be generally accurate.

13.3.2 Management Minutes System

Although we were unable to secure a presumably important paper with the description of the development of this system (see discussion below), the materials we received from Thoms together with our telephone discussion provided some indication of how this system is constructed. The core of this system, according to Thoms, is the Patient Care Profile (PCP) assessment form, which is used to gather

⁵ Dialog from telephone conversation with LTC Harper on February 17, 2000.

information about the direct, hands-on nursing care needs of any patient regardless of their diagnosis. In turn this information is used to determine staffing requirements, patient needs both pre-admission and in-house, and the cost of patient care.

Profiles are completed, if at all possible, by the same person each month. The process is limited to gathering information from hardcopy documentation and does not require direct patient assessment or interview. Charts are reviewed for documentation that supports, according to definition, the presence of any of the 18 patient care needs listed on the PCP form. The patient care needs used in this system, unlike the WMSN, are very applicable to a nursing home population and include the following: dispense medications and chart, skilled observation daily, personal hygiene (assist or total), aid with dressing, assist with mobility, feed (partial or total or tube feeding), incontinence (bowel and bladder), bowel and/or bladder training, positioning, decubitus prevention and skilled procedure daily.⁶ Each of the patient care needs has an assigned time value ranging from 10 minutes to 90 minutes. The time values for each of the patient care needs that apply to the patient are summed to provide an individual profile total. The sum of the patient profile totals by unit are used to calculate the number of hours of direct care required for each unit. Several other calculations using information from the PCP are performed in order to determine the number of licensed and non-licensed staff hours required.

13.3.3 Thoms' Management Minutes System: Critique

As noted above, it would be hard to argue that nursing time estimates generated from a single facility over 25 years ago could provide sufficient basis for establishing current staffing standards. In spite of these limitations, a number of health researchers have referred to Thoms' Management Minutes system as a basis for estimating the nursing needs and acuity of residents within a facility and as a basis to compare facilities.⁷ All of these health services researchers have referred to Thoms' "Management Minutes" system as described in a 1975 unpublished paper.⁸ We have not been able to secure a copy of this paper, nor did the now retired Thoms himself have a copy of this 25 year old unpublished paper. It is also unclear from those who have used Thoms' system, the degree to which they have used his

⁶ The instructions provide examples of the types of care activities that would be covered by the category as well as any exclusion criteria.

⁷ See: Dor, A; 1989. "The Costs of Medicare Patients in Nursing Homes in the United States." *Journal of Health Economics*. 8(3):253-270; Cohen, J., and Dubay, L., 1990. "The Effects of Medicaid Reimbursement Method and Ownership on Nursing Home Costs, Case Mix, and Staffing." *Inquiry*. 183-200; Cowles, C. M., Nursing Home Statistical Yearbook, 1997, The Johns Hopkins University Press, 1998; Harrington, C., et al, Nursing Facilities, Staffing, Residents, and Facility Deficiencies, 1992 Through 1998, Department of Social and Behavioral Sciences, University of California, San Francisco, CA., January 2000.

⁸ Thoms, W. 1975. Proposed Criteria for Long Term Care Quality and Cost Containment Systems. Unpublished paper, Greenbriar Terrace Nursing Home, Nashua, NH.

system with the time estimates unaltered. For example, in Cohen and Dubay's article referenced above, they refer to modification of Thoms' system by the West Virginia Medicaid program:

The long-term care case-mix index used in this project was derived from the Medicare/Medicaid Automated Certification System (MMACS) [the administrative data set that preceded OSCAR] patient characteristics, the "Management Minutes" system developed by Thoms (1975) and its adaptation by the West Virginia Medicaid program. Thoms' system assigns weights to discrete care-giving activities and characteristics of patients. Thoms' weights were developed using time and motion studies, and are, in theory, the actual minutes of care required on a daily basis for patients requiring specific procedures or with certain levels of impairments. . . The complete Thoms system recognizes very specific individual care needs. For example, any procedure or treatment ordered by a physician to be performed by a licensed nurse is counted as ten times the weight of the same procedure when not required to be performed by a licensed nurse. Ideally, we would utilize the complete system, but available data do not provide this level of detail. For the purpose of this study, Thoms' "minutes" are used to weight raw activities of daily living (ADLs) and service data, enabling the construction of a continuous case-mix measure. The long-term care index was constructed by multiplying the weights developed by Thoms, or modification of these weights made by the West Virginia Medicaid program, for ten patient characteristics by the percentage of patients with these characteristics and summing the results . . .⁹

The various patient characteristics employed by Cohen and Dubay include the proportion of patients completely bedfast, needing assistance with ambulation and eating, with indwelling catheters, incontinent, with decubiti, receiving bowel and bladder retraining, and receiving special skin care. It is not clear from the above the degree to which the West Virginia Medicaid program conducted new time motion estimates and the degree to which all of these adaptations of Thoms' even reflect Thoms' time estimates, with all the limitations discussed above.

All of these limitations notwithstanding, this system has another very severe limitation for setting nurse staffing standards across the United States. As with the WMSN, there is no evidence that the Management Minutes 25-year-old time estimates from a single facility are linked to resident outcomes, good or otherwise. In fairness to Thoms' the current focus on outcomes was not a primary concern of health researchers 25 years ago, and Thoms' was also concerned with developing a patient assessment instrument that could measure patient resource needs which would be reflected in

⁹ Cohen, J., and Dubay, L., 1990. "The Effects of Medicaid Reimbursement Method and Ownership on Nursing Home Costs, Case Mix, and Staffing." *Inquiry*. 183-200

reimbursement.¹⁰

13.4 HCFA's Staff Time Measurement Studies on Nursing Care in Nursing Homes, 1995-1997¹¹

13.4.1 Introduction

In contrast to the WMSN and Thoms' Management Minutes system described in the prior sections, HCFA's Staff Time Measurement studies were conducted during the last five years, primarily as a more resource intensive research effort as opposed to the development of a clinical tool for the staffing of nursing homes and hospitals. Hence, far more evidence is available to judge the applicability of staffing algorithms to U.S. nursing homes that may be derived from this project. The Health Care Financing Administration (HCFA) commissioned three major skilled nursing facility (SNF) Staff Time Measurement (STM) studies. The purpose of the studies was to define the relationship between individual SNF resident clinical characteristics and SNF staff time or resource use. The Resource Utilization Groups (RUG-III) were derived in part, and updated based on these studies. Resource utilization groups underlie the case-mix adjusted payment rates for both the Nursing Home Case-Mix and Quality Demonstration and the National Medicare SNF Prospective Payment System (PPS). Although the primary objective of this effort was to set prospective case-mix adjusted SNF payment rates, the staff time measurements for different kinds of residents could be used to derive staffing algorithms, as many have suggested.

13.4.2 Staff Time Measurement Data Collection

In efforts to refine the resource utilization groups, HCFA commissioned 1990 Staff Time Measurement data collection in seven States -- Kansas, Maine, Mississippi, South Dakota, Texas, Nebraska, and New York. Data were collected in 202 nursing facility units (7,684 residents), 12 of which were special Alzheimer's units (see Table 13.1: HCFA STM Data Collection). Nursing staff time was collected by stopwatch over a 24 hour period. Auxiliary staff time data were collected over the period of one week.

¹⁰ In some sense, Thoms' early concern with setting standards that are based on individual resident's needs, measurable, and convertible in dollars and cents (i.e., reflected in reimbursement) preceded recommendations by the 1986 IOM panel and many States and current Federal efforts to case-mix adjusted nursing home payments.

¹¹ The discussion in this section is based in large part from materials prepared by Karen E. Reilly, Sc.D., Abt Associates Inc., December, 1999.

Table 13.1 HCFA STM Data Collection				
Year	Facility Units	Residents	States	Data Collection Method
1990	202	7,684	KS, ME, MS, NE, NY, SD, TX	Stopwatch and paper Nursing—24 hours Auxiliary—7 days
1995	98	1,896	KS, ME, MS, OH, SD, TX, WA	Datawand, limited paper Nursing—48 hours Auxiliary—7 days
1997	74	2,037	CA, CO, FL, MD, NY	Datawand, limited paper Nursing—48 hours Auxiliary—7 days

In 1995, as part of the Nursing Home Case-Mix and Quality Demonstration's prospective payment design, HCFA commissioned another staff time measurement data collection effort. This second study encompassed seven States (Kansas, Maine, Mississippi, South Dakota, Texas, Ohio, Washington) and included 98 facility unit's (1,896) residents. To incorporate a therapy component in the case-mix reimbursement index, HCFA commissioned another data collection effort in 1997 focusing on high rehabilitation SNF units and including a broader geographic distribution of providers. Additionally, states and facilities were carefully chosen to generate a final analytic STM database that geographically represented the distribution of Medicare residents in the US. The 1997 STM data collection included 74 facility units, 26 of which were high rehabilitation units (2,037 residents) across five States (California, Colorado, Florida, Maryland, and New York). The 1995 and 1997 STM data collection included nursing staff time over 48 hours and auxiliary staff time over a seven day period. The 1995 and 1997 data were combined and provided the analytic database used to establish the initial national SNF Medicare PPS case-mix indices.

For the selected facilities and units within facilities, resident specific nursing time (RST) and nonresident specific nursing time (NRST) data were collected. RST included all nursing staff time of 30 seconds or more spent in an activity directly attributable to a specific resident. NRST included staff time not directly related to a specific resident but necessary as a part of unit administration.

The total nursing staff time estimates, both resident specific and nonresident specific, resulting from these data collection efforts equaled an average 250 minutes (4.16 hrs.) per resident day. This can be compared to an average of about 3.4 hours per resident day for facilities throughout the U.S. during this same period. Given how the facilities were selected and data was collected on only high-Medicare volume units within these facilities, it is not surprising that the STM estimates are considerable higher than typically found in U.S. nursing homes. The resident specific and nonresident specific nursing staff time estimates for each nursing category (RN, LVN, Aide) and for each of the 44 RUGs groupings can

be found in Table 13.2.

13.4.3 Critique: HCFA's Staff Time Measurement Study as a Basis for Setting Staffing Standards

Perhaps the most serious limitation in the WMSN and Thoms' Management Minutes system is that there is no evidence on the relation between these staff time allocations and resident outcomes, good or otherwise. In contrast, the selection of facilities for the Staff Time Measurement studies would seem to address this issue of outcomes:

An important consideration in each of these data collection efforts was the inclusion of only high quality facilities. The foundation of a national case-mix adjusted payment system, based on resource utilization is staff time associated with high quality resident care. That is, the staff time spent per resident must be sufficiently high to be considered quality clinical care. Toward this end, facilities met stringent selection criteria prior to being included in any of the staff time samples. For example, facility selection criteria in the 1997 staff time data collection effort included: a requirement that the facility be Medicare certified and have 8 or more Medicare residents on any unit, there be no waivers or complaints against the facility; the facility must meet or exceed the 1997 OBRA staffing requirements (1.5 RNs for a facility of 1-59 and at least 2.5 RNs for a facility of 60 or more residents); a 40% occupancy rate; the facility must deliver more than 110 minutes of daily resident specific nurse staff time; and each facility must pass quality review from a technical expert panel.¹²

Although there is at least some attempt in the STM studies to select high-quality facilities, it is difficult to determine how the specific selection criteria ensure this result. For example, some of the selection criteria seem trivial or irrelevant. When the average occupancy rate during 1995-1997 was about 85%, a minimum 40% occupancy is not very meaningful. Similarly, meeting the OBRA minimum staffing requirements does not seem to be meaningful when all facilities must meet these requirements.

¹² Personal communication from Karen Reilly to Marvin Feuerberg, March, 2000

Table 13.2 1995 & 1997 Resident specific and Nonresident specific Nursing Staff Time Estimates											
		Number	Percent	1995 & 1997 STM Pop Weighted				1995 & 1997 STM Pop Weighted			
RUG-III	ADL	in	in	Clinically Smoothed RST Minutes				Clinically Smoothed RST & NRST Min			
Group	Index	1995/1997	1995/1997	Staff Type		Total		Staff Type		Total	
		STM Pop	STM Pop	RN	LVN	AIDE	Minutes	RN	LVN	AIDE	Minutes
		3,933	100%	38.7	25.9	84.4	149.0	68.8	42.2	139.0	250.0
REHABILITATION											
REHAB ULTRA HIGH		343	8.7%								
RUC	16 - 18	45	1.1%	66.8	35.8	109.0	211.6	112.7	53.8	180.1	346.6
RUB	9 - 15	216	5.5%	48.8	23.0	73.9	145.7	87.7	37.4	123.8	248.9
RUA	4 - 8	82	2.1%	36.5	23.4	54.4	114.3	64.5	40.4	98.4	203.3
REHAB VERY HIGH											
RVC	16 - 18	37	0.9%	51.5	30.2	102.2	183.9	90.9	50.7	164.9	306.5
RVB	9 - 15	127	3.2%	53.1	25.5	83.0	161.6	94.7	41.6	136.3	272.6
RVA	4 - 8	89	2.3%	40.6	16.6	55.1	112.3	75.6	30.0	106.8	212.4
REHAB HIGH											
RHC	13 - 18	82	2.1%	66.4	35.0	105.0	206.4	110.6	53.5	167.0	331.1
RHB	8 - 12	112	2.8%	58.4	25.5	73.9	157.8	102.3	39.9	129.9	272.1
RHA	4 - 7	41	1.0%	49.6	16.7	51.1	117.4	89.7	27.6	102.6	219.9
REHAB MEDIUM											
RMC	15 - 18	123	3.1%	68.8	44.6	114.2	227.6	111.2	66.8	180.0	358.0
RMB	8 - 14	217	5.5%	56.3	25.7	80.4	162.4	101.2	42.4	141.8	285.4
RMA	4 - 7	76	1.9%	54.2	19.4	60.2	133.8	95.0	33.9	117.3	246.2
REHAB LOW											
RLB	14 - 18	26	0.7%	40.3	25.6	120.4	186.3	79.0	48.9	191.3	319.2
RLA	4 - 13	59	1.5%	31.2	17.8	69.6	118.6	64.5	32.0	122.8	219.3
EXTENSIVE											
SE3	NOT USED	73	1.9%	89.1	70.7	122.8	282.6	140.7	101.5	191.3	433.5
SE2	NOT USED	246	6.3%	69.1	56.7	104.7	230.5	110.4	85.4	163.2	359.0
SE1	NOT USED	20	0.5%	45.7	36.1	131.5	213.3	77.9	60.1	195.3	333.3
SPECIAL											
SSC	17 - 18	116	2.9%	40.8	41.9	121.1	203.8	72.9	64.3	184.1	321.3
SSB	15 - 16	126	3.2%	39.6	35.5	115.2	190.3	70.9	55.0	172.4	298.3
SSA	7 - 14	161	4.1%	56.5	26.8	79.6	162.9	91.7	41.7	130.4	263.8
CLINICAL COMPLEX											
CC2	17 - 18 D	11	0.3%	54.5	23.3	127.9	205.7	85.2	42.5	191.1	318.8
CC1	17 - 18	75	1.9%	31.9	38.4	115.5	185.8	55.7	57.7	176.9	290.3
CB2	12 - 16 D	47	1.2%	37.3	27.5	101.2	166.0	61.5	41.8	159.0	262.3
CB1	12 - 16	249	6.3%	29.9	22.6	94.1	146.6	59.0	36.2	147.3	242.5
CA2	4 - 11 D	41	1.0%	34.5	23.7	72.7	130.9	58.8	43.3	130.3	232.4
CA1	4 - 11	192	4.9%	33.3	23.8	56.7	113.8	59.7	37.6	103.3	200.6
IMPAIRED COG.											
IB2	6 - 10	31	0.8%	22.0	20.0	77.8	119.8	40.0	32.0	137.2	209.2
IB1	6 - 10	127	3.2%	22.0	18.0	73.9	113.9	39.0	32.0	130.0	201.0
IA2	4 - 5	4	0.1%	20.0	15.0	60.0	95.0	38.0	27.0	100.0	165.0
IA1	4 - 5	101	2.6%	20.0	15.0	50.0	85.0	33.0	26.0	96.0	155.0
BEHAV. ONLY											
BB2		2	0.1%	20.0	15.0	70.0	105.0	40.0	30.0	136.0	206.0
BB1	6 - 10	5	0.1%	18.0	14.0	70.0	102.0	38.0	28.0	130.0	196.0
BA2*	4 - 5	1	0.0%	19.0	15.0	50.0	84.0	38.0	30.0	90.0	158.0
BA1*	4 - 5	13	0.3%	17.0	15.0	40.0	72.0	34.0	25.0	73.5	132.5
PHYSICAL FUNCTION											
PE2	16 - 18	41	1.0%	17.0	14.3	123.9	155.2	37.0	32.0	184.8	253.8
PE1	16 - 18	160	4.1%	17.4	15.4	118.1	150.9	37.0	29.4	181.6	248.0
PD2	11 - 15	76	1.9%	16.9	16.0	90.7	123.6	36.0	25.0	170.0	231.0
PD1	11 - 15	358	9.1%	16.4	15.4	91.5	123.3	36.0	27.6	160.0	223.6
PC2	9 - 10	5	0.1%	15.0	23.8	99.4	138.2	25.6	32.8	154.4	212.8
PC1	9 - 10	41	1.0%	20.5	9.7	71.4	101.6	45.1	20.6	124.2	189.9
PB2	6 - 8	8	0.2%	15.0	22.9	39.3	77.2	28.0	36.8	80.6	145.4
PB1	6 - 8	86	2.2%	12.8	15.7	48.7	77.2	27.5	27.7	93.9	149.1
PA2	4 - 5	10	0.3%	14.7	15.9	33.2	63.8	31.9	30.6	72.9	135.4
PA1	4 - 5	175	4.4%	14.3	15.7	32.5	62.5	28.2	29.8	72.8	130.8
(clinically smoothed where bolded)											

It should be noted that staff time are not measured for all residents or even a sample of residents within the facility, but rather for residents on selected *units* within the facility. Although we can presume that these selected units provided a sufficient number of residents to provide staff time estimates for a residents with very different medical conditions and functional limitations (i.e., the 44 RUGs groupings), it is possible that the time estimates for these high-Medicare volume units is not representative of staff time found for similar residents in other units. It is also difficult to know how this particular “quality review from a technical expert panel” ensures good outcomes. We have no information about how the experts determined high quality. *In the last analysis, there appears to be no evidence that links the staff times of the STM studies to direct measures of resident outcomes.* This does not mean that the HCFA STM studies were inadequate for their central purpose, the development of the RUG-III and HCFA’s National Medicare SNF Prospective Payment System (PPS).

13.5 Conclusion: U.S. Army Workload Management System for Nursing, William Thoms’ “Management Minutes” System, and HCFA’s Staff Time Measurement Studies

This chapter has examined three time-motion methods for setting nurse staff levels: the U.S. Army Workload Management System for Nursing (WMSN); William Thoms’ “Management Minutes” system; and HCFA’s Staff Time Measurement studies on nursing care in nursing homes in 1995-1997. Common to all of these efforts is the attempt to identify the time it takes to complete nursing tasks for nursing home residents. These times are aggregated to the level of the facility and the nurse staffing required to provide this level of care is determined. The staffing algorithms derived from this method are adjusted for differences in the kind and intensity of care needed by residents with differing levels of acuity and functional limitations. As was noted at the beginning of this chapter, this method of deriving appropriate nursing staffing standards is intuitively understandable, particularly to those who find the statistical modeling of the empirical approach to be too complex, or suspect. If what nursing staff actually do impacts on some important resident outcomes, an assumption that would be hard to reject, then it would seem reasonable to determine how much time it takes to perform these necessary nursing tasks and the consequent staffing implied by this allocation of time.

Nevertheless, we have found all three of these *particular* efforts of little value for setting staffing standards. Both the WMSN and Thoms’ Management Minutes system were developed 20-25 years ago to assist the U.S. Army and in Thoms’ case, a single nursing home in New Hampshire, in assessing residents and the nurse staffing required to provide needed care. As such, they were not primarily research efforts addressed to a research community with published journal articles. Indeed, the WMSN is unknown to nearly everyone working in this area. After more than two decades, we have little to no evidence on the data collection procedures and evidence produced. The most knowledgeable person on the WMSN, Lt. Col. Harper, does not think this system, developed from an acute care hospital population, can be applied in its current form to the typical chronic-care population

found in nursing homes today. In contrast, Thoms' Management Minutes system has often been cited by various health services researchers. Unfortunately, they all reference a 1975 unpublished paper by Thoms' that we have not been able to obtain, even from Thoms himself. It appears that neither the WMSN nor Thoms' system has attempted to link their recommended staffing levels to residents' outcomes. Indeed, the current emphasis upon outcomes and quality indicators was not a particularly important consideration at the time they were developing their systems.

In contrast to the above, HCFA's more recent and more research intense STM studies provide far more information about the selection of facilities and data collection procedures. Further there is some attempt to select facilities on the basis of a criteria *which is thought* to be related to high quality. Unfortunately, we have found this criteria suspect for developing a staffing standard. As we noted above, "in the last analysis, there appears to be no evidence that links the staff times of the STM studies to direct measures of resident outcomes." Although we have found the three time-motion efforts review here to be an inadequate basis for setting nurse staffing standards, we think the time-motion approach has merit. A very inventive and entirely new analysis applying this time-motion approach will be presented in the next chapter.